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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/885,067	06/21/2001	Doyle A. Temple	HAMPT-1	4353
23599	7590	04/07/2004	EXAMINER	
MILLEN, WHITE, ZELANO & BRANIGAN, P.C. 2200 CLARENDON BLVD. SUITE 1400 ARLINGTON, VA 22201			HUBER, PAUL W	
			ART UNIT	PAPER NUMBER
			2653	

DATE MAILED: 04/07/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/885,067

Applicant(s)

TEMPLE

Examiner

Paul Huber

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-23 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-11, 13 and 15-22 is/are rejected.
- 7) ☒ Claim(s) 12, 14 and 23 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 2.
- 4) ☐ Interview Summary (PTO-413) Paper No(s) ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

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The specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1-3, 6-11, and 13 are rejected under 35 U.S.C. 102(e) as being anticipated by Itoh et al. (USP-6,504,810).

Regarding claims 1, 6, & 7, Itoh et al discloses a crystal 10 having holograms stored in layers therein, including a cylindrical crystal body formed about an axis and having polished flat end faces and a cylindrical periphery. See figures 2-4. The crystal 10 further includes annular arrays of holograms stored in the crystal 10, the annular arrays of holograms being stacked in layers within the crystal. See figure 7. When the crystal 10 is rotated about the longitudinal axis, annular arrays of holograms are stored in the crystal 10. The annular arrays of holograms are stacked in layers along the longitudinal axis direction by shifting the reference light beam in the longitudinal axis direction to form each stack.

Regarding claims 2 & 3, it is inherent that each annular array of holograms comprises individual holograms separated by the angle as claimed, and that the number of holograms or annular array is in the range as claimed.

Regarding claim 8, Itoh et al discloses a method of storing data in the form of holograms in a crystal 10, wherein the crystal 10 is a cylindrical crystal formed about an axis z, the crystal 10 having an axially facing surface 10a and a peripheral surface extending traverse to the axially facing surface 10a. See figure 2. From a source of light 15, a signal beam is provided containing the data and the signal beam is focused through the axially facing surface 10a of the cylindrical crystal 10. From the source of light 15, a reference beam is provided and focused through the peripheral surface of the cylindrical crystal 10 to interfere with the signal beam and thereby write a hologram in the cylindrical crystal 10. The cylindrical crystal 10 is rotated about the axis z thereof to write additional holograms in the cylindrical crystal 10 in an annular array. See figures 3, 4, and 7.

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Regarding claims 9 & 10, Itoh et al discloses indexing the crystal 10 axially with respect to the beams to write an additional annular array. See element 19 in figure 2 which moves crystal 10 in the A direction.

Regarding claims 11 & 13, Itoh et al teaches reading the hologram out of the crystal 10 by passing a reference beam there through to diffract from the holograms and produce a diffracted beam including the data of the holograms, and including reading the diffracted reference beam with a detector 22. See col. 9, lines 47-65.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Itoh et al, as applied to claim 1 above, in view of Official Notice.

Itoh et al discloses the invention as claimed, but fails to specifically teach that the crystal 10 is 4mm. However, it is manifestly well known in the analogous art of volume holography storage and reproducing systems that one can adjust the physical dimensions of the holographic crystal for the purpose of design choice, one reason for making the crystal more compact thereby resulting in a more overall compact recording/reproducing device, and Official Notice is hereby given.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Itoh et al such that the crystal 10 is made to be 4mm as claimed and as manifestly well known in the art. A practitioner in the art would have been motivated to make the crystal 10 to be 4mm for the purpose of design choice, one reason for making the crystal more compact thereby resulting in a more overall compact recording/reproducing device

Relative to the doctrine of Official Notice, see *In re Fox*, 176 U.S.P.Q. 340 at 341 (CCPA-1973).

Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Itoh et al, as applied to claim 1 above, in view of Official Notice.

Itoh et al discloses the invention as claimed, but fails to specifically teach that the crystal 10 is 3m. However, it is manifestly well known in the analogous art of volume holography storage and reproducing systems that

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one can adjust the physical dimensions of the holographic crystal for the purpose of design choice, one reason for storing more holographic images, and Official Notice is hereby given.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Itoh et al such that the crystal 10 is made to be 3m as claimed and as manifestly well known in the art. A practitioner in the art would have been motivated to make the crystal 10 to be 3m for the purpose of design choice, one reason for storing more holographic images.

Relative to the doctrine of Official Notice, see *In re Fox*, 176 U.S.P.Q. 340 at 341 (CCPA-1973).

Claims 15-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Itoh et al, as applied to claims 1-3, 6-11, and 13 above, in further view of Kawano et al (USP-6,452,890) and Official Notice.

Itoh et al discloses the invention as claimed, but fails to specifically teach that prior to splitting the laser beam into a reference beam and a signal beam the laser light is passed through a polarizing device. However, kawano et al discloses that "in a conventional holography ... it is necessary that the polarization directions of the signal beam and reference beam are in parallel ..." (col. 5, lines 32-37), for the purpose of insuring the accuracy of the holographic recording/reproducing system. Furthermore, it is manifestly well known in the art of holographic devices that one can utilize a polarizing device to polarize a laser beam in a single direction and Official Notice is hereby given.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Itoh et al such that prior to splitting the laser beam into a reference beam and a signal beam, the laser light is passed through a polarization device as well known in the art and as taught by Kawano et al. A practitioner in the art would have been motivated to do this for the purpose of insuring that the polarization directions of the signal beam and the reference beam are in parallel thereby improving the accuracy of the holographic recording/reproducing system.

Relative to the doctrine of Official Notice, see *In re Fox*, 176 U.S.P.Q. 340 at 341 (CCPA-1973).

Regarding claim 21, the detector 22 of figure 2 is a charge coupled device (CCD).

Regarding claim 22, the images of the holograms are coupled to the detector 22 by a mirror 18 reflecting the images transversely to the axis z through a lens 21 for focusing into the charge coupled device 22.

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The references cited on the PTO-892 each disclose a holographic recording/reproducing system.

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Claims 12, 14 and 23 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Any inquiry concerning this communication should be directed to Paul Huber at telephone number 703-308-1549.



Paul Huber
Primary Examiner
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